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Case Report
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Presence of Atypical Insertion of The Temporal Muscle Tendon and its Inter-Relationships in the Extraction of Third Lower Molar

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ABSTRACT

Introduction: the temporal muscle is covered by the dense temporal fascia, the fascia not only protects and contains the muscle, but also provides insertion for its anterior and middle fibers, since the flesh fibers originate from the infratemporal cavity and the middle portion of the fascia.

Case report: The purpose of this study is to expose an atypical variation of the temporal tendon in the region of the retromolar trigone, which presents a deep insertion, found during routine exodontia of the mandibular third molar, in addition to exemplifying the possible clinical-surgical implications. The surgical implications of this variation surpass from a simple difficulty in the detachment maneuver to the presence of exaggerated edema or even the presence of postoperative trismus.

Conclusion: Given the importance of precise incisions that preserve and do not destroy tissues, knowledge of anatomical variations is required.

Keywords: Temporal Muscle; Anatomic Variation; Ambulatory Surgical Procedures; Anatomy.

Introduction

The temporal muscle is part of the mastication muscles, consisting of three elevators of the mandible - masseter, temporal, medial pterygoid - and a considered protrusor and depressor when it acts in conjunction with infra-hyoids - lateral pterygoid, although there might be speculation of this function[1,2]. Both have the same embryological origin, being derived from the 1st pharyngeal arch, which gives rise to both the maxillary process and the mandibular process. Meckel 's cartilage composes this arch, being divided into tympanic, retromandibular - gives rise to the spheno - mandibular ligament - paramandibular - guides the growth of the mandibular and symphysical body[3].

The innervation of these muscles comes from the V-cranial nerve, the Trigeminal Nerve. This is a mixed nerve, being both afferent and efferent and this portion corresponds to the 3rd division - mandibular branch - that emits bundles of homonymous name to the muscle that will innervate[2,4].

Specifically approaching the temporal muscle, it is covered by the dense temporal fascia that divides into two leaves, one superficial and one deep, which surround the upper margin of the zygomatic arch internally and externally, exerting a counterforce during the action of the masseter muscle. The fascia not only protects and contains the muscle, but also provides insertion for its anterior and middle fibers, since the flesh fibers originate from the infratemporal cavity and the middle portion of the fascia, which gives the grouping a bipenado arrangement, a reinforced aspect when the fibers are replaced by a sagittally disposed tendon.

The posterior fibers serve to retract the mandible, while the average,s and anterior assist in the elevation, more in speed rather than power. Both bundles converge in a vast tendon that follows the path until its insertion in the borders and medial face of the coronoid process. This tendon passes between the zygomatic arch and the cranial wall and is attached to the medial aspect, apex, anterior and posterior edges of the coronoid process and anterior border of the mandible branch, being able to approach the third molar and obliquous line of the mandible, sometimes interfering with extractions due to the need for ostectomy in impacted and / or impacted teeth, surgical flap detachment or even the installation of total dentures[1,2,4].

It is concluded that two tendons of the temporal muscle can be pointed out during its insertion path, these being one superficial and the other deep. The first one is fixed on the anterior border of the ammodibular ramod and the second is commonly on the temporal crest and can approach the retromolar

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trigone[1,2]. Thereby, it is treated as uncommon in the literature the tendon approximation with invasion in the retromolar fossa also proximity with the distal face of the third molar. Figun and Guarino[1] have described that the tendon reaches the level of the retromolar fossa, however, without invading the fossa[5,6].

The purpose of this study is to expose an atypical variation of the temporal tendon in the region of the retromolar trigone, which presents a deep insertion, found during routine exodontia of the mandibular third molar, in addition to exemplifying the possible clinical-surgical implications.

Case Report

During routine extraction of element 38, regional anesthesia of the buccal, lingual and left inferior alveolar nerves was performed, as well as subperiosteal infiltrative terminal anesthesia with the function of providing hemostasis and facilitating mucoperiosteal detachment. It is important to emphasize that at the moment of the anesthetic injection in the retromolar region, it was noticed uncommon difficulty in the liquid deposit. The Avellanal Modified by Marzola incision was performed using blade 15, where after seizure and removal of the distal wedge the tissue was carefully taken off with Molt and then removed with the aid of the Modabe Farabeuf-type retractor, in such a way that it was possible to treat the tendon of the temporal muscle inserted in the retromolar region, specifically in the retromolar fossa, that corresponds to its deep tendon, denoting an atypical anatomical variation of the muscle, since this usually fixes itself above that region, in the coronoid process with extension in the anterior border of the ascending branch of the mandible (Figures 1, 2 and 3).

Figure 1. Atypical deep tendon insertion of the temporal muscle tendon (arrow) denoting the close relationship between it and the retromolar trigone region, which in a way may cause obstacles during the removal of third molars or even the fitting of a total prosthesis.

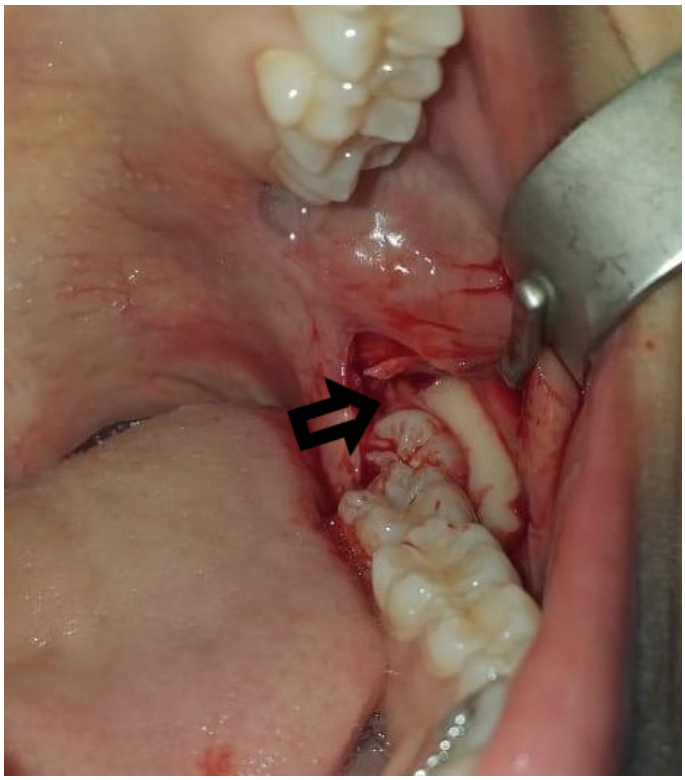

Figure 2. Marzola modified avellanal incision for tooth removal included. This denotes atypical insertion of the temporal muscle tendon in the retromolar trigone region (arrow).

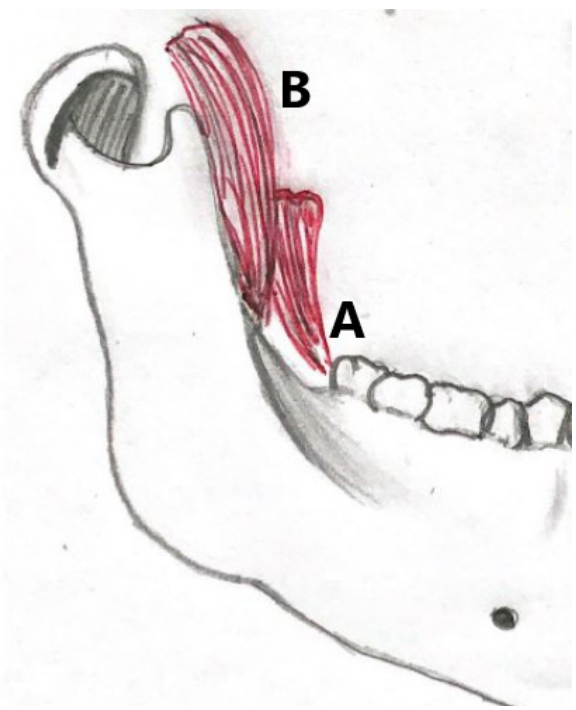

Figure 3. The following scheme is of the temporal muscle insertions for each of the two muscle portions:A) Deep portion – Inserts in the temporal crest, reaching the retromolar triangle; B) Superficial portion – Inserts in the anterior border of the mandible branch.

Discussion

During routine procedures, it is common to opt for techniques already consolidated in the literature. Although these techniques are doomed to anatomical misfortunes, employing innumerable variations, which are sometimes neglected during the transoperative period[7]. Hence, this fact is common for surgeons who have less experience or who are not protected by the knowledge of these changes. Moreover, this report exposes an atypical variation of the temporal muscle with lacks reports in the literature. It is possible to observe deep insertion of its tendon in the retromolar trigonal region close to the third molar. Besides, the deep insertion of the temporal muscle-tendon also invades the retromolar fossa and approaches the dental element's distal face[1].

It is noteworthy that Palomari *et al.* (2013)[8] treated this insertion as a sphenomandibular muscle, and was contradicted by other authors who claimed that such structure corresponds to the deep temporal muscle bundle. However, studies on corpses were performed in order to remedy such divergences, reaching the consensus that the beam denominated as sphenomandibular muscle is, in fact, the deep beam of the temporal muscle, since there is not a muscular septum separating such structures. The finding that it is the temporal muscle, seems more reasonable and corroborates with the opinion of the authors of this present study.

Such concepts and knowledge of the possible variations in the region are of great value, since the presence of protruding bundles of the muscle directly interferes in the installation of total prostheses, decreasing the stability when these extend to the external border of the retromolar trigone[2,6]. In this report, the fibers were incised and detached, since there was a need to perform ostectomy in the area.

On a daily basis, during mandibular third molar submodiectomy, a surgical approach called Avellanal Modified by Marzola is performed, consisting of a horizontal incision under the bony ridge of the alveolar ridge that extends to the distal of the second lower molar, where in this region makes a distal wedge that allows the excision of the pericoronary hood, ending with the execution of the oblique incision towards the back of the sac[9]. In this context, the approach enabled the identification of the unusual insertion reported.

In a nutshell, the surgical implications described surpassing from difficulty in the detachment maneuver to exaggerated edema or even the presence of postoperative trismus. Moreover, the surgical implications are directly related to the instability of the prosthesis (Sedlmayr *et al.*, 2009; Shon Ybarra *et al.*, 2001).

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